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Effect of myeloid-derived suppressor cells on Glioblastoma-immune dynamics

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Title: Effect of myeloid-derived suppressor cells on Glioblastoma-immune dynamics

Presenter: Hannah Anderson

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Abstract:

The highly immunosuppressive tumor microenvironment of Glioblastoma multiforme (GBM) leads researchers to consider immunotherapies in hopes of improving treatment outcomes. Monotherapy with anti-PD-1 has proved to be unsuccessful likely due to added layers of immunosuppression besides the PD-L1/PD-1 axis. Murine experiments show that CCR2⁺ myeloid-derived suppressor cells (MDSCs), which suppress T cells, are chemo-kinetically recruited by gliomas to the brain. Further, combination treatment with PD-1 and a CCR2 antagonist unmasked the immune checkpoint inhibitor's ability to reduce tumor growth. To gain insight on glioma-immune dynamics with the goal of future extension to immunotherapy, we develop and analyze an ODE model which includes immunosuppression via the PD-L1/PD-1 axis and MDSCs. We conduct parameter sensitivity analysis in combination with the approximate Bayesian computation rejection method to identify the interaction between the two layers of immunosuppression.